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FIRMS AND LAYOFFS: THE IMPACT OF UNIONIZATION ON INVOLUNTARY JOB LOSS

by

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Abstract

This paper focuses on the impact of unionization on involuntary job loss using establishment data from the 1997 National Employer Survey (NES-II) and merging those data with contextual data at the industry level as well as with local labor market data. The estimated logit models included information on unionization rates and employment security provisions present in collective bargaining agreements as factors influencing layoff rates for individual establishments, controlling for establishment size, firm structure, use of non-regular employees, product/service demand and local employment. Results show that the impact of unionization is not significant except for (1) establishments that operate in the non-manufacturing sector; and (2) establishments operating in industries that have major collective bargaining agreements which contain moderate employment security provisions. Under those conditions, unionization decreases layoff rates; otherwise, unionization has no effect on layoff rates. These results provide some evidence that unions may have placed increased emphasis on employment security in order to protect members against involuntary job loss. This is in contrast to earlier studies which found a positive relationship between unionization and layoffs. In addition, establishments in Right-to-Work states have higher rates of involuntary job loss.

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INTRODUCTION

Observers of the changing nature of work and employment in the United States have argued that the employment relationship is changing in fundamental ways with one of the key changes being a decline in job security (e.g. Neumark 2000; National Research Council 1999; Cappelli *et al* 1997). Job security refers to the likelihood of losing a job involuntarily. Job loss has always been a risk during times of economic downturns or decreased product demand, but workers can also lose jobs for a number of reasons not related to product demand or individual performance but as a consequence of strategic decisions, e.g. reorganization, merger or acquisition, introduction of a new technology or process, or change in production locations. Generally, top management in an organization makes decisions regarding employment adjustments, while the impact of such programs is directly borne by the employees who involuntarily lose their jobs. The process of decision-making regarding employment changes can differ in the emphasis placed on workers' interests. In some establishments, the interests of workers as a group are represented by unions. In fact, unions are the only institutionalized form of worker representation in the U.S. employment system. Does unionization have an effect on organizational practices such as downsizing and layoffs which result in involuntary job loss?

Involuntary job loss is problematic since it disrupts the lives of employees, and many lose substantial wages and benefits (e.g. Hammermesh 1989; Fallick 1996). Farber (1998) found that despite the strong labor market in the mid-1990s, the rate of job loss did not decline during that period. In fact, the rate of job loss during 1993-95 was similar to the rate of job loss during the slack labor markets of 1989-1991 and 1981-83. Stewart (2000) also found that job loss rates increased from the 1970s to the 1980s but remained constant through the early and mid-1990s. The high rate of job loss, despite strong labor markets, reflects the increased use of reductions in workforce by companies facing more competitive markets. Analysts have generally linked the increased use of intentional workforce reductions, or downsizing, to features of the new economy such as greater international competition, institutional ownership of firms, deregulation of industries and rapid technological change (Capelli et al

1997; Budros 1997). Firms are responding strategically to changes in their environment by trying to increase efficiency through restructuring, implementing new technologies, shifting production, and other measures that may result in job loss for a substantial number of workers .

Unions offer workers the opportunity to act collectively through bargaining over wages, hours, and other terms and conditions of employment as well as provide management a means of communication with groups of workers. Some of the advantages of union membership have been well-established, such as the wage premium for union members relative to comparable nonunion workers (e.g. see Jarrell and Stanley 1990). Other studies have also linked unionism to fringe benefits (e.g Freeman, 1981; Glass and Fujimoto 1995), receipt of workers' compensation (Hirsch, MacPherson, and Dumond 1997), and the receipt of unemployment insurance benefits (Budd and McCall 1997). Since the interests of workers have been increasingly threatened by involuntary job loss, unions may have been able to mobilize similar resources to provide greater employment security for their members.

Although union membership in the U.S. has been declining, it is still important to study the role of unions since unions are currently the only institutionalized form of worker representation in the U.S. In 2001, an estimated 13.5 percent of wage and salary workers were members of a union (U.S. Dept. of Labor 2002). Some industries have much higher concentrations in the 40-50 percent range such as automobile manufacturing, transportation, and steel (Hirsch and MacPherson 1997). Other highly unionized industries include paper and telecommunications (Voos 1994, Keefe and Batt 2002). In addition, researchers have found evidence of spillover effects on the wages and benefits to nonunion employees (Solnick 1985). Furthermore, there are threat effects which pressure employers to provide compensation and to implement practices similar to those found in unionized workplaces in order to prevent unionization (Podgursky 1986, Leicht 1989). Thus, any impact that unions are able to make regarding the process of workforce adjustment may extend beyond unionized workplaces.

There have been a few empirical studies that have examined relationship between unionization and layoff rates. The earlier studies using data collected in 1980 or earlier (Medoff 1979; Montgomery 1991; Groothius 1994) consistently found a positive association between unions and layoffs. The nature

of layoffs and job elimination has changed since that period. Firms had during that period had laid off workers as a response to decreased demand due to business cycles. During the 1980s, firms began to eliminate jobs or layoff workers either as part of a larger restructuring effort or as part of a direct strategy to reduce labor costs. As a consequence, the layoffs in the previous studies were temporary layoffs and not permanent layoffs, which have become more common. More recent research using the 1994 and 1997 National Employers Surveys (NES) examined downsizing and establishment performance (Cappelli 2000). Overall, the presence of a union seemed to be positively associated with layoffs, but not in the manufacturing sector. This suggests a possible shift in union priorities towards greater employment security.

Like Cappelli's work, this study uses the 1997 NES to examine factors associated with job loss, but this study focuses specifically on unionization. Establishment characteristics are merged with selected industry data, with multiple factors incorporating the role of unions. Despite increased competition, firms still make choices about the use of their labor force over time, and firms vary on the extent to which they accommodate workers' interests. Union representation can exert greater pressure to accommodate workers' interests; but, ultimately, the extent to which they are successful depends on the relative power of unions and management. This research draws on sociological perspectives on power in both organizational and industrial relations contexts to establish the conditions under which unions affect employment adjustment in the late 1990s.

LITERATURE REVIEW

Before hypothesizing about the impact of unionization on organizational decisions' regarding employment adjustment, it is first necessary to understand (1) the multitude of non-union factors driving the restructuring process in organizations; (2) the effect of unions on employment levels; and (3) the results and context of prior research on unions and layoffs.

Firm Restructuring and Downsizing

Social scientists and researchers have recognized that downsizing and restructuring is an important feature of the post-industrial economy and an increasingly used management strategy; yet, there is very little systematic research examining the causes of downsizing or restructuring across firms that have different characteristics or operate within different industries. Explanations for downsizing often refer to general trends among organizations facing changes in their environment, particularly greater competition.

As firms face an increasingly global economy, Harrison (1994) argues that

> "Lean production, *downsizing* [italics added], outsourcing, and the growing importance of spatially extensive production networks governed by powerful core firms and their strategic allies, here and abroad, are all part of businesses' search for 'flexibility,' in order to better cope with heightened global competition.' (190)

Many American firms have chosen the "low road" to company profitability, where management tries to beat the competition by cheapening labor costs. They move operations to low-wage rural areas or Third World countries. They routinely outsource work that used to be performed in-house to independent subcontractors and pay them less. The incorporation of such practices reduces the need for labor within the focal firm. This is in contrast to the "high road" to economic growth and development which entails investing and training their employees to increase their productivity and, subsequently, their standard of living. Harrison further speculates that American companies were able to choose the low road because of the weakness of the American labor movement and the decline in union density. The weakness of labor and the upsurge in corporate restructuring were fueled by a sudden increase in imports and uncertainty in financial markets. It was easier for firms to cut costs than to invest in training or equipment to boost profits.

In addition to increased foreign competition and the pursuit of flexibility, Capelli *et al* (1995) identified several other factors that have pressured firms to restructure employment. Financial restructurings which included mergers and acquisitions, selling off unrelated businesses, and leveraged buyouts, also fueled job cuts. There were pressures to avoid redundant positions and streamline businesses to improve profits. For publicly-held companies, the growing concentration of ownership among institutional investors gave shareholders greater power than other stakeholders in the corporation (also Useem 1993), and their interests centered around profit and performance. Bethel and Liebeskind (1993) found that job cuts resulting from restructuring were greater when shareholders were organized into large blocs, such as institutional holdings. One study found that share prices rose an average of four percent as a short-term response to layoffs announced as part of a restructuring (Worrell, Davidson and Sharma 1991). In addition, management incentives based on stock prices contributed to efforts to reduce costs by cutting jobs.

Budros (1997) added to these economic pressures a social explanation for the adoption of downsizing programs using an institutional perspective on diffusion. Institutional theorists (e.g. DiMaggio and Powell 1983; Strang and Meyer 1994) argue that innovations, e.g. downsizing, flow through a system of organizations that are perceived to be similar as legitimacy increases. Budros' study of Fortune 100 firms found that firms were more likely to downsize when a greater percentage of Fortune 100 firms had previously downsized. He argued that as more firms downsized, downsizing as a practice became more legitimate and taken for granted. Thus, there were social pressures to incorporate downsizing into management strategy among organizations that were perceived to be similar.

Firms vary in the extent to which they are subject to increased economic competition, investor pressures, and social pressures for legitimacy. It is also likely, however, that there are other unspecified factors that influence organizational decisions to eliminate jobs. In order to control for some of these, it is useful to consider the industry in which a firm operates. Groothius (1994) found marked differences in layoff rates between firms in different industries. Agriculture and mining, construction, manufacturing, and transportation relied more heavily on layoffs than did services, wholesale trade, retail trade and

finance, insurance and real estate. Fallick's (1996) review of recent studies on displaced workers mirrors the findings from the firm level at the individual level. Displaced workers have been disproportionately concentrated in manufacturing, mining, and construction, but relative rates of displacement from retail trade, professional services, and finance, insurance, and real estate have been rising (Fallick, 1996). Firms in the same industry are likely to have similar technological, capital, and labor requirements that shape restructuring alternatives.

Unions and Firm Employment Levels

Much of the research on unions and employment can be found in the labor economics and industrial relations literature. The neoclassical economics model of unions states that as unions raise wages and costs, unionized plants in competitive markets will suffer declines in employment and will eventually go out of business. Lalonde et al (1996) used longitudinal data to examine the effects of union organizing campaigns on manufacturing plants. They found that successful unionization of production workers led to significant reductions in employment, none of which were related to any increase in relative wages. This was consistent with Freeman and Kleiner's (1990) study that documented a decline in employment after union certification with no accompanying changes in wages or benefits. Instead, they documented substantial changes in industrial relations practices.

In addition to the immediate effect of union certification, researchers have also examined the growth rate of plants or establishments with union and nonunion jobs. Leonard (1992), using a sample of California manufacturing plants, compared employment growth rates within regions and industries in union and nonunion plants and found that the annual growth rate for unionized plants is significantly lower (by four percentage points) than for non-union plants. This negative effect on the growth rate did depend on establishment size. Unions only slowed employment growth in plants with 155 or more employees. Leonard notes that the slower growth rate of union jobs is contributing to the decline in union density.

Cavanaugh (1998) studied the effect of unionized labor on firm performance, including employment growth. He also found that unions slowed employment growth, particularly when firms had greater asset-specific investments. This highlighted the "bargaining problem" faced by firms with high union density and make asset-specific investments. Such firms lose money if they sell their investments but are subject to higher wage demands from unionized labor. These results were consistent with those of Bronars, Deere and Tracy (1994) in their study of the effect of unions on firm behavior. They found that greater unionization was associated with slower employment growth and less investment in durable assets, as well as a host of other firm-level outcomes.

These studies do find support for an association between unionization and slower employment growth. It is less clear, however, that this is simply a result of higher wage demands. Other mechanisms are at work such as changes in industrial relations, managerial decisions regarding investment and production, and the increased competition faced by firms.

Union and Layoffs

As firms face changes in product demand as well as increased competition, firms may need to adjust employment levels downward, either in terms of the number of workers or the number of hours worked. Unions have had an active role in determining work hours and length of workweeks for their members. Unions can either support adjustment through reducing hours while maintaining employment levels or through reducing employment while keeping the number of hours worked stable. Medoff (1979) argued that unions reflect the interests of senior members who would prefer inverse-seniority layoffs rather than across-the-board reductions in work hours. Golden (1990) found that unions did contribute to the stability of the number of hours in a workweek while increasing employment volatility. Others came to the opposite conclusion: unions are more inclined to use hours reduction as work-sharing devices during economic recessions (Earle & Pencavel 1990). Brannon (1997), controlling for industry effects, also found that unions cause firms to react to changes in demand by changing wages or the hours

of work per worker rather than employment. Thus, it is unclear whether or not unions encourage a reduction in employment or work hours.

Although collective bargaining agreements may specify work hours, the firm management usually determines the level of employment and whether or not to use layoffs. As mentioned earlier, collective bargaining agreements generally have seniority-based rules about the order of layoffs, but seniority also offers protection against layoffs in non-union firms (Abraham and Medoff 1984). So what are the differences in layoff rates between union and nonunion firms or workers? Medoff (1979) used individual and industry data for U.S. manufacturing workers to determine the effect of unionization on layoff rates. He found that workers in industries with a greater fraction of unionized workers had a substantially and significantly higher probability of being laid off than workers in less unionized industries. He argues that this was a result of lower quit rates, more rigid real wage growth, avoidance of weekly hours reduction, and lower unemployment insurance taxes per employee for unionized firms.

Montgomery (1991) extended and Medoff's analysis by using 1980 establishment data for private, for-profit firms, since *firms*, and not industries, lay off workers. He found that unionization had a much smaller effect on layoff rates than in Medoff's study using industry-level data, particularly when establishment size was considered. For manufacturing establishments, it was not clear whether increased layoffs could be attributed to unionization or large establishment size. For nonmanufacturing establishments, however, unions do tend to increase layoff rates regardless of size, and the effect is about 43% larger than in manufacturing establishments. Groothuis (1994) used the same 1980 establishment data to estimate the effect of unions on quit, dismissal, and layoff rates. Not surprisingly and consistent with Montgomery's analysis, he found that unionization had a positive and significant effect on layoff rates while having no effect on quit or dismissal rates. Recognizing that employment security is a characteristic of a job that workers value, Heywood (1989) suggests that union workers are compensated for lower employment security with higher wages.

Three previous studies—two of which used the same establishment data--found a positive association between unions and layoffs. The data used in these studies were collected in 1980 or earlier.

Important changes in the economy, managerial strategies, and industrial relations warrant the use of more recent data on employer practices. Capelli (2000) used the 1994 and 1997 National Employer Surveys to examine the incidence of downsizing and its effect on establishment performance. Capelli distinguishes between layoffs--job loss associated with shortfalls in demand--and downsizing, job loss associated with attempted gains in operating efficiencies. In his examination of a wide range of factors affecting downsizing practices, Capelli characterizes the presence of unions as a factor affecting labor costs as unions are associated with wage premiums and work rule restrictions. This creates an incentive to eliminate union jobs. Alternatively, union contracts may also contain restrictions on layoffs that could act as disincentives for job cuts. When examining layoffs that reflect overall job loss, evidence from the National Employer Surveys show that during 1991-1994 period, unionization is associated with increased layoffs. For the 1994-1997 period, however, the NES suggests that for manufacturing establishments, unionization seems to have no significant effect. To examine downsizing, the same analysis was performed only on establishments that were operating at or above capacity but still decreased employment over the time period. In the subsample of "downsizers," in both periods, the presence of a union increased the extent of job loss. Overall, the presence of a union seems to be associated with layoffs.

Capelli's much needed detailed analyses on factors that affect downsizing offered a first look at the role unions have played more recently in layoff practices. In his analyses, unions are represented as a dichotomous variable indicating whether or not unions were present in an establishment. More research needs to be done to further specify the role of unions as not all unions are the same. They differ as to how they operate as independent organizations as well as how they operate at different establishments in varied industries. Other studies that focus specifically on the role of unions are often case studies of specific firms or industries (e.g. Voos 1999). The present research aims to include some of the relevant factors suggested by these case studies as variables in analyses across a wide range of firms and industries.

RESEARCH QUESTION

Research using data from 1980 and earlier found unions to be associated with higher rates of layoff. Those studies concluded that at that time unions were willing to trade higher wages for lower levels of employment. Using data from the 1990s, Capelli (2000) also found that the presence of unions is often associated with layoffs. There is some suggestion in his analyses, however, that the role of unions may be changing as he found no significant effect of union presence on overall job loss during the latter period of 1994-1997. This paper aims to further examine the relationship unions and layoffs by incorporating richer measures of unionization at the establishment and industry level, using only the 1997 National Employer Survey. In addition, firms and unions do not operate within a vacuum but within industries and also subject to local employment conditions.

The need to further explore the question of the effect of unions on involuntary job loss is precipitated by the shift by management in the use of layoffs as part of their corporate strategy and the subsequent response from unions. Prior to the early 1980s, firms used layoffs as a temporary adjustment to decreased product demand. Product demand was often cyclical and some of the workers could expect to be called back to work when product demand increased. In this era, unions fought for higher wages instead of steady employment. The wage premium for union workers has been well-documented. Workers who were temporarily on layoff could receive unemployment benefits and then enjoy higher wages when they returned to work. Higher wages at the expense of employment levels seem reasonable when some workers could expect to be recalled. In addition, Medoff (1979) argued that temporary layoffs were often based on inverse seniority and the preferences of senior workers may have dominated at the bargaining table.

In more recent years, however, firms have adopted restructuring and downsizing programs as a way to increase efficiency and cut costs. Layoffs are *permanent* rather than temporary. As a consequence unions have also had to change their focus from higher wages to greater employment security for their entire membership, not just senior workers. For example, in their collective bargaining agreements with Ford, General Motors, and Chrysler in the 1980s, the United Auto Workers ceded substantial wages and benefits packages in return for some control over workforce adjustments. These

included having a voice in layoff decisions, "guaranteed income stream benefits," company-funded employee development and training programs, establishment of job banks, and promises of continued employment (Addison 1986, Katz and MacDuffie 1994). The 1990-1993 and 1993-1996 contracts included even more income and job security programs such as the provision that workers could not be laid off for more than 36 weeks *regardless of the cause* (Katz and MacDuffie 1994). The UAW saw income security programs as a mechanism to raise the cost of layoffs to companies, giving them a greater incentive to maintain employment.

In the 1999-2003 contract between the UAW and DaimlerChrysler, DaimlerChrysler agreed not to spin off or sell any division or close or sell any factories (New York Times, September 28, 1999). In addition, if employment falls below a certain set level, DaimlerChrysler must replace workers at predetermined ratios. Similar provisions were made in the GM and Ford agreements. In fact, the UAW agreement contained a clause that allowed workers at Delphi, an automotive parts maker spun off by GM earlier this year, the right to return to work at GM if they lost their jobs during the four-year agreement. An interesting innovation in the UAW-Ford agreement was a provision that allowed Ford to spin off its Visteon Automotive Systems into a separate company, but its 23,000 UAW employees will remain Ford employees, entitled to continued pensions and benefits (White and Ball 1999). Collective bargaining in the auto industry may not be typical in terms of union bargaining strength, but it does exemplify ways in which unions can impact employment security.

Unions are not necessarily able to bargain over employment security for workers who are affected by restructuring. The courts have an impact on what issues employers *must* bargain with unions. Unions can affect the rate of job elimination that results from *technological changes* since the courts and the NLRB have consistently held that the effect of technological change is a mandatory subject of bargaining (Keefe 1992). Unions generally focus on mitigating any adverse effects of implementing new technology by work preservation and work adjustment programs. Thus, job elimination as a result of technological changes may be planned further in advance, decreasing the need to resort to layoffs.

In contrast, job elimination resulting from restructuring or the shifting of work to other locations, often occurs without worker or union input. Court decisions have held that an employer deciding to transfer work from one plant to another has no duty to bargain with the union, unless the decision is solely based on reducing labor costs or a specific contract clause that requires bargaining (Keefe 1992). The courts consider restructuring decisions to be completely within management's control. Restructuring often involves measures to increase efficiency and cut costs, which leads to job cuts and layoffs.

Unions are able to affect firm decisions to lay off workers by making it expensive to implement layoff programs or by obtaining specific provisions in the collective bargaining agreements that prohibit job cuts. Whereas job security has become more important to the entire membership, we can expect unions to push for greater employment security. The extent to which they are able to negotiate for employment security measures greatly depends on the relative strength of the union membership, industry demand, and local labor markets.

THEORETICAL PERSPECTIVES AND HYPOTHESES

A sociological perspective on the impact of unions on layoff practices recognizes the power relations between two organizations (1) the union, representing the interests of the employees or workers, and (2) company management, representing the interests of the employers or owners. Bacharach and Lawler (1981) developed a theoretical model for studying bargaining power that is based on the work of Emerson (1962) and Blau (1964) on dependence in power relationships. Emerson argues that power is not an attribute of an actor (either person or group), but rather an aspect of a social relationship between actors. Social relationships involve ties of mutual dependence; that is, actors do not engage in a relationship unless a social exchange occurs. Power resides in the dependence of one actor upon the other to meet a goal or desire. That is, actor A has power over actor B when actor B depends upon A for a good or service. It follows from mutual dependence that A also depends on B for a good or service; thus, giving B power over A. Blau defines power as "the ability of persons or groups to impose their will on

others despite resistance." Including the condition of resistance is important as it implies that power is not being exercised if both actors have the same will.

In developing a resource dependence perspective, Pfeffer and Salancik (1978) extended these arguments to the organizational level. Organizations depend on other social actors outside the organization that control access to needed resources, such as supplies, capital, technology, or labor. In turn, this resource dependency allows external actors to control or influence organizational activities. Intended influence and control can be considered as synonymous with power[1] (Wrong 1988). In this case, the focal organizations are employing firms whose activities may include job elimination. Unions are the social actors outside of the focal organization who have some control over access to labor, a resource needed by the organization. Thus, the firm's need for labor allows unions to potentially control or influence organizational activities, e.g. restructuring programs that include job elimination. This leads to my first hypothesis:

H1 Unionized firms eliminate fewer jobs than non-unionized firms.

This hypothesis incorporates several assumptions. First, I make the assumption that preserving jobs for all members has become a priority for unions. As discussed earlier, permanent layoffs from restructuring and downsizing are not necessarily seniority based and are likely to affect groups of workers with varying tenure. Thus, if unions represent workers who prefer to remain employed and long-term job security has been increasingly threatened, unions will use their power to preserve jobs. This assumption is supported by the emphasis on employment security in more recent collective bargaining agreements. Second, I make the assumption that many firms want or need to eliminate at least some jobs, having discussed the pressures on firms to increase competitiveness and reduce costs. These assumptions are necessary to fulfill Blau's definition of power in that unions are able to impose their will on employing firms despite resistance.

[1] Wrong (1988) differentiated between intended and *unintended* influence as well as general social control versus deliberate control over specific actors' behaviors. He confined the term 'power' to the exercise of intentional control and asserted that is "is identical to *intended* and effective influence." (4)

Pfeffer and Salancik (1978) further specify the conditions that enable external actors to exercise power or control over an organization. The conditions relevant for this study include (a) the importance of the resource to the focal organization, (b) the inability of the focal organization to obtain the resource elsewhere; (c) the social actor's discretion in the allocation, access, and use of the critical resource; and (d) the focal organization's discretion and capability to take the desired action (260). These conditions lead to the following hypotheses about the varying ability of unions to preserve jobs because they affect how much a firm depends on unionized labor.

The most obvious source of power for unions is union density, or the proportion of workers who have been organized by unions, both within the firm and within the industry. This exemplifies condition (c) in that greater union density allows the union to access more workers and to coordinate their activities. During collective bargaining sessions, the threat of strikes is more effective when it includes more workers. Conversely, if management seeks to lower employment levels, unions can negotiate alternatives such as the reduction of work hours to avoid layoffs.

H2a Higher rates of unionization will be associated with lower rates of job loss.
H2b Firms operating in industries with higher union density will be associated with lower rates of job loss.

Workers increase their value to a firm by having needed skills. As firms increase their need for skilled labor, the greater the importance of workers to the firm. It also becomes more costly to recruit and train new workers to acquire the necessary skills, particularly if fewer potential workers are available (condition b). Decreasing levels of unemployment decrease the dependence of workers and unions on a specific firm and increases the dependence of the firm on their current workers.

H3 Firms operating in local labor markets with decreasing unemployment rates will have lower rates of layoff.

It is also important to consider the amount of discretion management has in implementing job elimination programs (d). The most direct way in which unions limit management discretion in adjusting employment levels is through collective bargaining agreements. Institutionalists will emphasize the role of the state in shaping establishment practices. States that have Right-To-

Work laws that prevent unions from establishing a union shop within an establishment affects the impact unions will have in all establishments operating in such a state. If collective bargaining agreements cannot specify union membership as a condition of employment, then fewer workers will be represented by the unions.

H4a Establishments located in states with Right-to-Work laws will have higher layoff rates.
H4b The effects of unionization on lowering firm layoff rates will be reduced in establishments located in states with Right-to-Work laws.

Furthermore, unions vary to the extent to which they are able to ratify collective bargaining agreements. In some industries, unions are able to ratify collective bargaining agreements which cover over thousands workers. These can be workers with the same employer or with multiple employers. Other industries that do not have the concentration of unionized members have collective bargaining agreements which cover fewer employees, limiting the effects of unions and collective bargaining agreements on employment security.

H5a Establishments operating in industries without major collective bargaining agreements will have higher layoff rates.
H5b The effects of unionization on lowering firm layoff rates will be reduced in establishments operating in industries without major collective bargaining agreements.

Finally, collective bargaining agreements can vary as to the extent to which employment security is emphasized. Collective bargaining agreements can have restrictions on employment levels, subcontracting, plant closings, implementation of technological changes and the like which affect decisions on job eliminations. Some agreements establish co-management structures that focus on these issues.

H6b Establishments operating in industries that have collective bargaining agreements with strong employment security measures will have lower rates of layoff.
H6a The effects of unionization on lowering firm layoff rates will be greater in establishments operating in industries that have collective bargaining agreements with strong employment security measures.

Apart from union power and collective bargaining agreements, other conditions pressure management to cut labor costs as well as limit their capabilities to do so. The influence of these factors must be considered when focusing on the effect of unions and collective bargaining. First, the economics

of decreasing demand forces management to decrease production and layoff workers. Firms operating in industries which are in decline are more likely to layoff workers because they are less able to delay or absorb the costs of providing employment security.

H7 Firms operating in declining industries will have higher rates of job layoffs.

In addition, per worker labor costs further constrain management options when firms face greater competition and need to reduce costs. Higher average labor costs will pressure firms to reduce costs by reducing labor.

H8 Firms with higher labor costs will have higher rates of layoff.

There has also been increased interest in how companies use part-time, temporary and contract workers (e.g. Abraham and Taylor 1996; Houseman and Polivka 2000). Pfeffer and Baron (1988) argued that firms have shifted to externalized work arrangements to protect their core or permanent workforce. In fact, firms with human resource policies that emphasize long-term employment, commitment of a permanent workforce, and a shared vision of distinctive competence need to externalize some jobs to enhance their flexibility (Osterman 1994). If companies want to trim labor costs, there is less commitment to temporary and contract workers—and often part-time workers—so that those workers lose their positions first. These are not usually reported as layoffs they do not involve regular employees, who are most likely to be unionized. This gives management greater ability to adjust employment levels without affecting full-time regular employees.

H9 Firms with a higher percentage of temporary employees will have lower rates of layoffs.

Hypotheses 7-9 include factors that need to be statistically controlled in the analyses focusing on union impact. All of these hypotheses will be tested using the data described in the next section.

DATA

In order to test the effects of unions on the behavior of employing organizations, it is most appropriate to have firm- or establishment-level data on unionization and job loss. In 1994, the U.S.

Census Bureau conducted the National Employer Survey (NES) for the National Center on the Educational Quality of the Workforce (EQW). About 900 of the respondents from this 1994 survey also participated in the follow-up survey conducted in 1997 (NES II), again administered by the Census Bureau. Like the NES, the NES II was a telephone survey using computer-assisted telephone interviewing (CATI). Both NES samples were drawn from the Standard Statistical Establishment List (SSEL), a listing of establishments drawn from Internal Revenue Service records and based on tax reports from employers, and included U.S. business establishments at least twenty employees. There is an oversampling of large establishments and establishments in the manufacturing sector. The sample for the NESII has three specific components. First, the 900 employers who had completed the 1994 survey, which are the esatablishments included in Capelli's analysis (2000). Second, there was an oversampling of establishments (N=2000) in states involved in particular educational reform efforts, i.e. California, Kentucky, Michigan, Maryland, and Pennsylvania. The remaining establishments, approximately 2500, made up a representative sample of the rest of the United States.

The focus of the survey was on firm practices regarding (1) hiring, training, and human resource practices; (2) participation in school-to-work programs; and (3) awareness of community and education initiatives. Survey questions did ask for information about the firm and their labor force. Respondents were asked how many of their non-managerial, non-supervisory employees were covered by a collective bargaining agreement as well as how many of their permanent workforce left involuntarily (e.g. were fired or laid off) in the past year. The earlier 1994 survey did not ask about involuntary separations; thus, this research uses only the 1997 survey respondents which totaled 5,465 establishments and had a response rate of 78 percent.

In addition to the need to measure layoffs at the firm or establishment level, it is also important to incorporate measures of the context in which firms and unions are operating. Hirsch and MacPherson (1993, 1993-1998) provide data on union membership and coverage from the *Current Population Surveys* (CPS) by industry. Local unemployment data by county was provided by the *Local Area Unemployment Surveys* conducted by the Bureau of Labor Statistics. Manufacturing production data were taken from the

National Bureau of Economic Research-Center for Economic Studies (NBER-CES) Productivity Database (Bartelsman and Gray 1996). Non-manufacturing gross output data were taken from the Bureau of Economic Analysis *Gross Domestic Product by Industry Data* (U.S. Department of Commerce).

To incorporate data regarding collective bargaining agreements, collective bargaining agreements from the Bureau of Labor Statistics *Collective Bargaining Agreements File*, were used to determine the strength of employment security measures by industry. The file consists of approximately 2,100 collective bargaining agreements--virtually all agreements in government and private industry covering 1,000 or more workers. Of the approximately 900 agreements covering the private sector, approximately 500 were used to assess the level of employment security generally provided by collective bargaining agreements for each industry at the three-digit SIC level. If there were fewer than five collective bargaining agreements in an industry, all agreements were used. If there were more than five in an industry, then a purposive sample of agreements were chosen based on the unions and employers involved as well as the state(s) covered. Geographic location was important since states with right-to-work laws limit the impact of union bargaining. Unions generally negotiate one collective bargaining agreement with one employer and use that first agreement as a model for agreements with other employers, resulting in very similar agreements across employers. Thus, purposive sampling that includes a variety of unions and employers and states within an industry better characterizes the industry as a whole.

MEASURES

DEPENDENT

Job Loss

The dependent variable of interest is involuntary job loss. In the NES II, respondents reported the percentage of the establishment's permanent workforce who had left involuntarily (e.g. were fired or laid

off) in the past year [JOBLOSS]. This value does not include reductions in employment based on attrition. The focus is explicitly on employees involuntarily losing jobs.

INDEPENDENT: ESTABLISHMENT-LEVEL

Unionization

Percent covered by collective bargaining. Respondents in the NES-II reported the percentage of total employees who were covered by a collective bargaining agreement [UNRATE].

Union vs. Non-union. For this dichotomous variable, establishments were coded either UNION=1 if any employees were union members or covered by a collective bargaining agreement or UNION=0 if no employees were.

Labor Costs

Cost per employee. Respondents in the NES-II reported the total labor cost used in the production of 1996 sales. This included wages, salaries, and other non-wage benefits such as health care, pensions and insurance. The independent variable (LABCOST) was constructed by dividing total labor cost reported by the total number of employees. Thus, the measure indicates how much, on average, each employee costs the establishment.

INDEPENDENT: INDUSTRY LEVEL

Each establishment was coded as operating in an industry classified according to the 1987 three-digit SIC codes. The following variables were collected at the industry-level and the values were merged onto the establishment record by 3-digit SIC code.

Union

Unionization rate. Hirsch and MacPherson (1997) supplied unionization rates by industry (COVERED) calculated from responses to the Current Population Survey question asking whether or not

the individual respondent is covered by a collective bargaining agreement. Rates by three-digit SIC level were computed from the rates reported by industry codes used by the CPS.

*Major Collective Bargaining Agreement*s. Each 3-digit SIC level industry was coded for the existence of a collective bargaining agreement covering 1,000 or more workers [MCBA].

Strength of Employment Security Provisions. Each 3-digit SIC level industry was coded for the strength of employment security provisions [SECURITY] found in the major collective bargaining agreements in that specific industry as follows: (0) No major collective bargaining agreement; (1) Has a major collective bargaining agreement with little or no mention of employment security provisions; (2) Major collective bargaining agreements have moderate employment security provisions (i.e.. has provisions in several areas affecting employment levels) ; and (3) Major collective bargaining agreements have strong employment security provisions (i.e. specifically addresses employment security as a major concern; includes employment level guarantees and specific steps to avoid job loss resulting from subcontracting, plant closings, technology changes, etc).

Industry Demand

Change in demand. For manufacturing industries, change in demand is the percentage change in annual production dollar value from 1996 to 1997. For non-manufacturing industries, change in demand is the percentage change in gross output dollar value from 1996 to 1997. The appropriate value for each industry by 3-digit SIC code is represented by the variable, CHDEMAND97.

INDEPENDENT: GEOGRAPHIC LOCATION

Local unemployment

Change in unemployment rate. Annual unemployment rates by county for 1995 and 1996 and merged with the establishment record. The change in unemployment rate from 1995 to 1996 was calculated by subtracting the 1995 rate from the 1996 rate and dividing the difference by the 1995 rate [CHUNEMPL].

Right-to-Work laws

Right-to-Work State. Each establishment was coded [RTW=1] if the establishment was located in a state with Right-to-Work laws; RTW=0, otherwise. These states included Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Iowa, Kansas, Louisiana, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, and Wyoming.

CONTROL

Control Variables

Establishment Size. In the NES-II, respondents reported the number of employees on the payroll at the end of 1996. [SIZE].

Multi-establishment. In the NES-II, the respondent reported if there was more than one establishment in the firm. The variable was coded as 1 if "YES;" 0, otherwise. [MULTI].

ANALYSIS

To test for the effects of unions and other factors on the involuntary job loss, I needed to use a multivariate model that incorporates factors affecting layoffs mentioned in this study. Montgomery (1991), Groothius (1994), and Cappelli (2000) all used a censored regression model, or Tobit model, to analyze their data. Montogomery states that the Tobit model is appropriate since the dependent variable, percent layoffs, is truncated below at zero. In his examination of the components of turnover rates—quit rates, dismissal rates, and layoff rates—Groothius also states that the Tobit model is appropriate because of the large number of zero values for each rate. Despite the merits of these arguments, the Tobit model is not used in this research.

The Tobit model assumes that there is a latent variable, y^*, that is observed when $y^* > 0$, but takes the value of 0 when $y^* < 0$ (McDonald and Moffitt 1980). The dependent variable of primary interest is the percentage of workers who are laid off, or involuntarily lose their jobs. This variable cannot conceptually fall below 0. Workers cannot involuntarily be hired, the implication of a negative value. Therefore, when the observed value of the dependent variable, y, is 0, then the firm laid off no

workers for that period, and 0 is the true value of y. The Tobit model is appealing because it accounts for the large number of firms that tend to cluster at 0, but there are other models that can be used which do not assume that a latent variable exists which is censored at 0.

Since a layoff rate is a fraction varying between 0 and 1, Medoff (1979) used a logit model to study layoff rates by industry. In this study, I use the same equation to model the layoff rate by firm:

$$y = \exp(\mathbf{X'\beta})/1+\exp(\mathbf{X'\beta}) \quad (1)$$

where *y* is the percentage of workers laid off in the firm (firm layoff rate), the vector β contains the parameters to be estimated, and the vector **X** contains the factors influencing the firm layoff rate. Equation (1) can also be written in the "log odds ratio" form:

$$\ln (y / 1-y) = \mathbf{X'\beta} \quad (2)$$

which will be used in the empirical analysis to estimate the parameters. The first model (Model 1) tested includes the main effects with controls for firm-level characteristics available in the NES-II data (Hypotheses 1-3, 7-9):

$$\ln (\text{LAYOFF1}/ 1- \text{LAYOFF1}) = \text{UNION}\beta_1 + \text{UNRATE}\beta_2 - \text{MULTI}\beta_3 + \text{SIZE}\beta_4 + \text{LABCOST}\beta_5 - \text{PCTTEMP}\beta_6 \quad (3)$$

The next model (Model 2) includes contextual effects of industry, labor market, and collective bargaining effects (all hypotheses):

$$\ln (\text{LAYOFF1}/ 1- \text{LAYOFF1}) = \text{UNION}\beta_1 + \text{UNRATE}\beta_2 - \text{MULTI}\beta_3 + \text{SIZE}\beta_4 + \text{LABCOST}\beta_5 - \text{PCTTEMP}\beta_6 - \text{COVERED}\beta_7 - \text{CHDEMAND}\beta_8 + \text{CHUNEMPL}\beta_9 + \text{RTW}\beta_{10} - \text{MCBA}\beta_{11} - \text{SECURITY}\beta_{12}. \quad (4)$$

After estimating OLS coefficients for equations 3 and 4 using all firms, the same equations were estimated separately for manufacturing and non-manufacturing firms. The results suggested the importance of (a) Right-to-Work laws and (b) the role of major collective bargaining agreements as an industry characteristic on the establishment layoff practices. Thus, the same equations were estimated for separate samples of establishments grouped by (1) the existence of Right-to-Work laws in the state of

operations and (2) the strength of security provisions in major collective bargaining agreements for the industry in which the establishment operates.

RESULTS

Table 1 contains descriptive statistics for the final NES-II sample used in the analyses. More than two-thirds of the establishments have no union presence, but in a significant minority of establishments (23.5%) more than half of the workers are unionized. In examining the extent of layoffs, about one-fifth of the establishments that no layoffs, but over half laid off less than five percent of their workers. The establishments are relatively large as almost half of the sample has 250 or more employees. Almost two-thirds of the establishments are part of a multi-establishment firm.

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Table 1 about here

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The entire NES-II sample is representative of the population of U.S. establishments employing 20 or more workers (see Capelli 2000), but the sample used in this research includes only establishments in industries that have all contextual data available. Generally speaking, retail establishments are severely underrepresented in the final NES-II sample and manufacturing is overrepresented. This bias could be problematic in interpreting descriptive statistics, but its effects should be minimized when examining coefficients representing relationships between the factors and the dependent variable, involuntary job loss.

All Establishments

Table 2 presents the standardized OLS coefficients for the logit function of layoff rates ln(layoffs/1-layoffs) for all establishments. The first column contains coefficients for the model containing only establishment-level variables. The coefficients for being unionized and the percent of workers unionized are not significant. Size is positively associated with the probability of layoff while

the percentage of temporary workers and labor costs are negatively associated with the probability of layoff. The effect of size may signal attempts at efficiency as "fat" firms shed excess workers. The effect of temporary workers lends support to the hypothesis that non-regular employees are used to protect core employees from fluctuations in employment (Pfeffer and Baron 1988; Davis-Blake and Uzzi 1993; Osterman 1994). Interestingly, labor costs are also negatively associated with layoffs. This is contrary to the wisdom that increased labor costs drive up costs and force layoffs. One explanation for this association may be that high labor costs are a reflection of the use of more skilled labor. Firms are reluctant to lay off highly skilled labor and risk not being able to replace them later.

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Table 2 about here

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The second column is the full model containing the contextual variables at the industry level as well as local labor market data. Again, the coefficients for union presence and unionization rate at the establishment-level are not statistically significant. When the contextual variables of (1) the presence of major collective bargaining agreements in the industry, (2) the strength of employment security measures in those agreements, and (3) the presence of Right-to-Work laws are added, the effects of unions *in an institutional context* become statistically significant. The presence of a major collective bargaining agreement in the establishment's industry group is associated with a higher probability of layoff in the establishment compared to an establishment operating in an industry with no major collective bargaining agreement, contrary to Hypothesis5a. As the strength of security measures in those agreements increase, however, the probability of layoff decreases, supporting Hypothesis 6a. Further, establishments operating in states with Right-to-Work—where union membership cannot be a condition of employment—have have higher rates of layoff, supporting Hypothesis 4a.

Table 3 presents the same OLS coefficients for manufacturing and non-manufacturing establishments Size is again positively associated with layoffs for both sectors. The negative effect of labor costs is only significant for non-manufacturing establishments. The negative association between

temporary workers and layoffs only appears in the full model (Model 2) for non-manufacturing establishments. Interestingly, the industry unionization rate has a strong negative effect on layoff rates but only for non-manufacturing establishments. This partially explains the discrepancy with Medoff's results as Medoff only considered manufacturing establishments. It is also only in non-manufacturing establishments that the presence of a major collective bargaining agreement in the industry is associated with higher layoff rates. The positive association between higher layoff rates and operation in a Right-to-Work state is present for both the manufacturing and non-manufacturing sector but only statistically significant for manufacturing.

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Table 3 about here

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Table 4 present the OLS coefficients for establishments operating in Right-to-Work states vs. states without Right-to-Work laws. For establishments in Right-to-Work states, the establishment-level characteristics of size, use of temporary workers, and labor cost have the effects discussed previously. No industry or labor market variables have any statistically significant effects. For establishments in states without Right-to-Work laws where union shops are legal, the effects of size and use of temporary workers are present, but labor costs are no longer significant. In addition, the effects of major collective bargaining agreements in the industry are present as in the results using all establishments. Major collective bargaining agreements have no significant effect in Right-to-Work states.

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Table 4 about here

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Table 5 presents standardized OLS coefficients for establishments operating in industries that (1) either have no major collective bargaining agreements or no employment security provisions in an agreement, (2) have weak employment security provisions in the industry's major collective bargaining agreements, (3) have moderately strong employment security provisions, and (4) have the strongest

employment security provisions. None of the variables have any significant effect on layoff rates for establishments operating in industries that have the strongest employment security provisions. Size has its positive effect in the other three categories. For establishments in industries with weak employment security provisions, operating in a Right-to-Work state increases the probability of layoffs. For establishments in industries with moderately strong employment security provisions, the presence of a union in the establishment has a negative effect on layoff rates. (Interestingly, higher rates of unionization at the establishment level has a positive effect on layoff rates, though not statistically significant, p=0.2). Higher rates of union coverage in the industry have a negative effect on layoff rates. This paper's major hypotheses, Hypotheses H1 and H2b, are supported suggesting that unions can have a negative effect on layoff rates but only under specific conditions.

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Table 5 about here

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DISCUSSION

These analyses suggest that the role of unions in encouraging or discouraging layoffs is limited. There is evidence that the effect of unionization rates on layoffs has shifted since 1980 from a positive association—i.e. that unionization encourages layoffs—to either having no association or, under specific conditions, a negative association. At a general level where all establishments across all industries and locations are analyzed, (a) whether or not an establishment is unionized, nor (b) the proportion of workers in the establishment who are unionized, has a significant effect on layoff rates. This is not surprising as unions are measured generically when, in fact, they can differ widely in their agendas, membership bases, and historical bargaining patterns.

The importance of allowing for differences in unions is highlighted by the significance of measures that incorporate characteristics of the environment in which these establishments operate. The probability of establishments laying off workers is influenced by industry collective bargaining

agreements—both their existence and whether or not they are able to include strong employment security provisions. It seems that the existence of a major collective bargaining agreement is associated with higher rates of layoffs. This could be interpreted as being consistent with earlier studies that found unionization to be positively associated with layoffs. Alternatively, it is the result of a spurious effect where workers in industries more susceptible to layoffs are also more likely to organize in large numbers. Once they are organized, however, as the strength of employment security provisions increases, the probability of layoffs decreases which merely indicates that collective bargaining agreements are effective when they can be negotiated.

Analyses conducted on smaller subsamples showed that higher industry unionization rates were associated with lower layoff rates in the non-manufacturing sector and in industries that have moderate employment security provisions in their collective bargaining agreements. In the non-manufacturing sector, the importance of union coverage may be a reflection of the large variation in union coverage and labor relations among the industries. This suggests that unions have a real impact on the layoff practices in establishments where they ware able to organize greater numbers of workers. The lack of an effect in the manufacturing sector may reflect a homogenizing, spillover, or threat of unionization effect across similar industries where unionization has historically been stronger. Non-union establishments have an incentive to mimic management practices of union establishments to avoid unionization. Thus, the actual percentage of workers covered by collective bargaining agreements has no effect.

In addition to industry unionization rates, being a unionized establishment in industries that have major collective bargaining agreements with moderate employment security provisions significantly lowers layoff rates. *Moderate* employment security provisions refer to the presence of clauses in the collective bargaining agreements that address potential causes of involuntary job loss but do no offer any employment guarantees or prohibit plant closures or moves. For example, in an agreement covering 35,000 workers in establishments manufacturing men's and boy's suits (SIC 331), there were provisions for (a) equal division of work during slack periods, (b) prohibiting subcontracting if employer's factory is not fully employed, and (c) limiting outsourcing to 20 percent of current year's production. Industries in

this category include paper mills (SIC 262), petroleum refining (SIC 262), farm and garden machinery (SIC 352), laboratory apparatus (SIC 382), local passenger transportation (SIC 411), and grocery stores (SIC 541), among others.

For establishments operating in industries with *strong* employment security provisions, being unionized does not have the same effect. Again, this is suggestive of a spillover effect in industries where unions have the power to negotiate for strong employment security provisions. In such industries, perhaps the relative strength of the unions have allowed them to influence practices of all establishments whether they are unionized or not. Being able to negotiate for *moderate* employment security provisions suggest that unions in these industries may occupy the middle ground in that they are able to influence practices only at their organized establishments but not others. In the two remaining industries, unions may be too weak to have much influence.

The existence of Right-to-Work laws weakens the position of unions and their subsequent bargaining efforts, rendering them less effective in influencing management practices and potentially less effective in providing employment security. Establishments located in Right-to-Work States have slightly higher probabilities of laying off workers in all subsamples, but the coefficients are only statistically significant in the manufacturing sector and in industries that have weak employment security provisions. This emphasizes the importance of considering the legal climate in which firms and unions must operate. Many collective bargaining agreements cover union members across states but the impact of those agreements is lessened when union membership is not a condition of employment. Therefore, management has greater discretion in employment level adjustments in establishments located in Right-to-Work states.

Results from the NES-II sample confirm that unionization—at the establishment and industry-levels—can provide greater employment security in establishments operating in non-manufacturing industries or across industries if unions can negotiate moderately strong employment security provisions in their collective bargaining agreements. Alternatively, unions also seem to impact layoff practices as establishments in states that allow union shops have lower layoff rates. In a recent volume on collective

bargaining (Clark *et al* 2002), Richard Bank—director of the AFL-CIO's Center for Collective Bargaining—acknowledges the importance of job security on the union agenda:

> ". . . An integrated approach is absolutely essential to success. Organizing puts workers under union jurisdiction. Good contracts with *strong job security provisions keep them there. Organizing without negotiating job security is like trying to fill a bucket with a hole in it* [italics added]. (350)"

Although unions would like to control organizational behavior regarding employment security, their power to do so depends heavily on certain conditions described previously. Greater union density at the firm and industry level as well as the legality of union shops represents greater discretion by the union in the allocation, access, and use of the critical resource (condition c). The presence of collective bargaining agreements represents limitations on the focal organization's discretion and capability to take the desired action (condition d). Without having reinforcing conditions, unions seem to make little power in preventing involuntary job loss.

These results warrant further study on the role of unions in encouraging layoffs. The preliminary evidence suggests the union stance towards layoffs and involuntary job loss has changed since the 1980s. It is imperative to include characteristics of both the establishment and the environment in which the establishment operates. Further research would incorporate a stronger longitudinal component that could incorporate progressive collective bargaining agreements and changes in union membership and industry trends. Information on other types of employment adjustment practices that are related to layoffs would also enrich this line of research.

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Table 1. Descriptive Statistics for 1997 NES (N=2346)

Variable	Category	Percent of Sample
Percent Of Workers Unionized[+]		
	0 %	72.9 %
	More Than 0 To 25%	1.4
	More Than 25 To 50%	2.3
	More Than 50%	23.5
Percent Workers Laid Off in Past Year	0 %	19.4 %
	More Than 0 to 5 %	54.5
	More Than 5 to 10 %	12.1
	More Than 10 to 25 %	9.7
	More Than 25 to 50 %	3.1
	More Than 50 %	1.2
Size	Less than 50 Employees	17.8 %
	50 to 99	16.6
	100 to 249	18.6
	250 to 1000	33.2
	More Than 1000	13.8
Multi-Establishment Firm		64.2 %
Major Industry Group	Food and Tobacco	7.0
	Textile and Apparel	5.7
	Lumber and Paper	7.8
	Printing and Publishing	7.0
	Chemicals and Petroleum	5.9
	Primary Metals	7.6
	Fabricated Metals	8.6
	Machinery and Instruments	8.9
	Transportation Equipment	6.9
	Other Manufacturing	8.3
	Construction	3.2
	Transportation Services	3.5
	Communications	1.5
	Utilities	2.4
	Wholesale trade	0.8
	Retail Trade	1.5
	Finance	1.0
	Insurance	3.0
	Hotels	4.2
	Business Services	4.1
	Health Services	1.0

Table 2: Standardized OLS Regression Estimates of *ln(LAYOFFS/1-LAYOFFS)* for All Establishments

	Model 1	Model 2
Establishment Characteristics		
Unionized	-0.095	-0.086
Percent Unionized	0.002	0.013
Multi-Establishment Firm	0.039	0.032
Size	0.115***	0.111***
Percent Temporary Workers	-0.063**	-0.057***
Labor Cost	-0.058**	-0.057**
Industry Characteristics		
Percent Under Collective Bargaining Agreement		-0.017
Change in demand 1996-1997		0.035
Major Collective Bargaining Agreement present		0.080*
Strength of Security Provisions in Major Collective Bargaining Agreement		-0.080*
Local Labor Market		
Change in unemployment 1995-1996		0.021
Located in Right-to-Work State		0.060**
R^2	0.027	0.036

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 3: Standardized OLS Regression Estimates of *ln(LAYOFFS/1-LAYOFFS)* using NES-II by Sector

	Manufacturing (N=1742)		Non-Manufacturing (N=604)	
	Model 1	Model 2	Model 1	Model 2
Establishment Characteristics				
Unionized	-0.117	-0.103	-0.073	-0.060
Percent Unionized	0.023	0.024	-0.083	-0.030
Multi-Establishment Firm	0.046	0.039	-0.011	-0.016
Size	0.076**	0.070**	0.205***	0.196***
Percent Temporary Workers	-0.025	-0.025	-0.108	-0.103*
Labor Cost	0.010	0.025	-0.090*	-0.109*
Industry Characteristics				
Percent Under Collective Bargaining Agreement		-0.001		-0.204***
Change in demand 1996-1997		0.030		-0.004
Major Collective Bargaining Agreement present		0.073		0.133*
Strength of Security Provisions in Major Collective Bargaining Agreement		-0.058		-0.062
Local Labor Market				
Change in unemployment 1995-1996		-0.003		0.063
Located in Right-to-Work State		0.063*		0.059
R^2	0.014	0.020	0.08	0.12

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 4: Standardized OLS Regression Estimates of *ln(LAYOFFS/1-LAYOFFS)* Right-to-Work States vs. Union Shop States

	Right-to-Work (N=655)		Union Shop (N=1691)	
	Model 1	Model 2	Model 1	Model 2
Establishment Characteristics				
Unionized	0.021	0.033	-0.116	-0.121
Percent Unionized	-0.072	-0.047	0.020	-0.031
Multi-Establishment Firm	0.010	0.010	0.044	0.045
Size	0.136**	0.135**	0.095***	0.096***
Percent Temporary Workers	-0.084*	-0.092*	-0.084***	-0.089***
Labor Cost	-0.085*	-0.088*	-0.046	-0.046
Industry Characteristics				
Percent Under Collective Bargaining Agreement		-0.077		-0.002
Change in demand 1996-1997		0.050		0.035
Major Collective Bargaining Agreement present		0.038		0.095*
Strength of Security Provisions in Major Collective Bargaining Agreement		-0.004		-0.105*
Local Labor Market				
Change in unemployment 1995-1996		0.043		0.015
R^2	0.034	0.044	0.026	0.031

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 5: Standardized OLS Regression Estimates of *ln(LAYOFFS/1-LAYOFFS)* by Level of Employment Security Provisions in Industry Agreements

	Strength of Security Provisions			
	None (N=341)	Weak (N=627)	Moderate (N=371)	Strong (N=308)
Establishment Characteristics				
Unionized	0.075	0.013	-0.292*	-0.090
Percent Unionized	-0.019	-0.084	0.156	-0.010
Multi-Establishment Firm	0.096	-0.049	0.019	0.080
Size	0.146*	0.125**	0.185***	0.069
Percent Temporary Workers	-0.057	-0.017	-0.020	-0.101
Labor Cost	-0.051	0.017	0.050	-0.112
Industry Characteristics				
Percent Under Collective Bargaining Agreement	-0.087	0.006	-0.148**	0.081
Change in demand 1996-1997	-0.054	0.091*	0.054	0.095
Local Labor Market				
Change in unemployment 1995-1997	0.055	0.014	-0.020	0.017
Located in Right-to-Work State	0.009	0.083*	0.045	0.103
R^2	0.080	0.040	0.086	0.079

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$